

## Team Problems for Chapter 2

Name: Solutions

Spring 2017

Date: \_\_\_\_\_

**Problem #1: Perimeter and Area**

1. The owner of an art framing store recommends using a flat frame that is 1.5 inch wide to frame a painting that is 15 inches by 18 inches.
- a. Draw a picture (not necessarily to scale) of the painting and its frame.



- b. What is the perimeter of the painting?

$$15 + 15 + 18 + 18 = \boxed{66 \text{ in}}$$

- c. What is the perimeter of the outside edge of the frame?

$$18 + 18 + 21 + 21 = \boxed{78 \text{ in}}$$

- d. What is the area of the front part of the frame (without the picture)?

$$\begin{aligned} &= \text{Area of picture + frame} - \text{Area of picture} \\ &= 18 \times 21 - 15 \times 18 = \boxed{108 \text{ in}^2} \end{aligned}$$

**Problem #2: True/False Problems**

Fill in the blank next to each of the following statements with "T" for True and "F" for false. If the statement is true, explain why it is true or give an example. If the statement is false, give a counterexample.

**Remember! If a statement is only sometimes true, then it is FALSE.**

- T 1. If a number is divisible by 4, then it is divisible by 2.  
*Divisible by 4 means it can be divided twice by 2.*
- F 2. Two nonparallel lines intersect in one point.  
*Only if they are coplanar - skew lines are nonparallel and do not intersect.*
- F 3. The city of Portland is in Oregon.  
*Portland could refer to Portland, Maine*
- F 4. Obtuse angles measure  $130^\circ$ .  
*An angle measuring  $150^\circ$  is also obtuse.*
- T 5. An angle that measures  $92^\circ$  is obtuse.  
*This angle measures  $> 90^\circ$ .*
- T 6. If a month begins with the letter M, then the month has 31 days.  
*May & March both have 31 days.*

**Problem #3: Laws of Deductive Reasoning**

If it is possible, use the Laws of Deductive Reasoning to draw conclusions from the following statements, and state which law you are using. If it is not possible to draw a conclusion, tell why.

1. If you live in the Bronx, then you live in New York.  
Tracy lives in the Bronx.

Tracy lives in New York  $\rightarrow$  Law of Detachment

2. If you are a high school student, then you like art.  
Ling likes art.

Cannot make a conclusion. Art lovers are not necessarily HS students by this statement.

3. If you improve your vocabulary, then you will improve your score on a standardized test.  
If you read often, then you will improve your vocabulary.

If you read often, then you will improve your score on a standardized test.  $\rightarrow$  Law of Syllogism

4. If a whole number ends in 6, then it is divisible by 2.  
If a whole number ends in 4, then it is divisible by 2.

Cannot make a conclusion. One would need to start w/ conclusion of the other in order to use the Law of Syllogism.

**Problem #4: Writing Conditional Statements**

Write the converse, inverse, and contrapositive of the conditional statements:

- a. "If two segments are congruent, then they have the same length."

Converse:

If two segments have the same length, then they are congruent.

Inverse:

If two segments are not congruent, then they do not have the same length.

Contrapositive:

If two segments do not have the same length, then they are not congruent.

- b. "If I win, then you don't lose."

Converse:

If you don't lose, then I win.

Inverse:

If I don't win, then you lose.

Contrapositive:

If you lose, then I don't win.

**Problem #5: More Writing Conditional Statements**

1. Write the following well-known quotations as conditional statements (in "if-then" form).
- a. Mark Twain wrote, "If you tell the truth, you don't have to remember anything."

If you tell the truth, then you don't have to remember anything.

- b. Helen Keller wrote, "One can never consent to creep when one feels the impulse to soar."

If one feels the impulse to soar, then one cannot consent to creep.

- c. Mahatma Ghandi wrote, "Freedom is not worth having if it does not include the freedom to make mistakes."

If freedom does not include the freedom to make mistakes, then it is not worth having.

- d. Benjamin Franklin wrote, "Early to bed and early to rise makes a man healthy, wealthy, and wise."

If a man goes to bed and wakes up early, then he will be healthy, wealthy, and wise.